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Dr. Cockerille
With the regards of the
Author.



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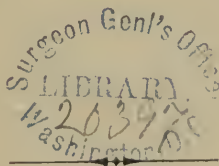
SOME SUGGESTIONS

CONCERNING THE

NATURE AND TREATMENT

OF

✓
DECAY OF THE TEETH.



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ERRATA.

~~Page 9, 10th line from top, for "dependent" read "dependant"~~

Page 12, 4th line from bottom, omit "so."

Page 31, 6th line from bottom, omit "s" from the word "results;"

same page, 5th line, omit "s" from "methods."

Page 37, 3d line from top, instead of "known. But," read "known, as."

I.

STRUCTURE OF THE TEETH.

THE human teeth, or those portions of them, visible in the mouth, are familiar in appearance to every one. Every individual is provided, during life, with two sets of teeth. At about the age of two years, the teeth of the first, or temporary set, are completed. Of these there are twenty. At about the age of six years these teeth begin to fall out, and, gradually, to give place to those of the permanent set, which, with the exception of the wisdom teeth, are completed at about the twelfth year. The wisdom teeth, as they are termed, usually make their appearance at from the eighteenth to the twentieth year, although there is great irregularity as to the

time of their coming. The number of the teeth of the permanent set is thirty-two.

The second or permanent teeth, are divided into four classes. As reference must be made, in the following pages, to particular teeth, it is necessary that the reader should know the names by which they are designated. The four front upper teeth, (the names given to those of the lower, correspond, exactly, to those of the upper jaw,) are the *incisor* or cutting teeth. Those contiguous to them, one on each side, are called the *canine* or eye-teeth. The next are the *bicuspid*es, of which there are two on each side. These are intermediate to the eye-teeth, and the *molar* or jaw-teeth, (as they are commonly called,) of which there are three on each side. The last of these three are the *wisdom teeth*, one on each side.

Some acquaintance with the structure of the teeth is necessary to any clear understanding of the disease by which they are so commonly attacked and destroyed. A very brief and general description, however, is all that

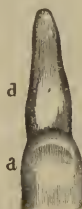
is necessary to the purpose of the following pages.

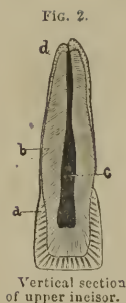
That portion of a tooth which is uncovered, when it occupies its natural position in the mouth, is called, technically, the *crown*. (Fig. 1, *a*.)

The part concealed by the gum is called the *fang*, or *root*. (Fig. 1, *d*.) The roots of the teeth are firmly fixed in sockets, formed of thin bone, which grow up with them, and by which they are firmly embraced.

The teeth bear a certain resemblance to the bones, but they differ from them in their intimate structure, and in the fact, that a large portion of each tooth is exposed to contact with agents of every kind, external to the body. They differ, also, in other particulars. They are composed, principally, of a hard, bone-like substance, to which the name of *dentine* has been applied. (Fig. 2, *b*.)

FIG. 1.

Front view
of an upper
incisor tooth.



The dentine of the crown is covered, completely, with a layer of *enamel*, (Fig. 2, *a*,) so called from its density, and the polished, vitreous appearance which it presents. The dentine of the fang is covered with a layer of bone, (Fig. 2, *d*,) as the crown is covered with enamel. This layer is termed the *cementum*.

These three constituents form the hard part of the tooth, and are composed, principally, of the same substance, lime; but in structure, that is, the manner in which the material is employed to make up each particular part, they are strikingly different.

The dentine is composed of a series of tubes, (Fig. 2,* *b*,) opening from the cavity of the "nerve," (presently to be described,) and running thence to the under surfaces of the enamel and cementum. These tubes are separated from each other by a homogeneous, ivory-like

* Fig. 2, it should be understood, is a mere diagram, intended to give some idea of the different parts of a tooth, and their relative positions.

substance. Fig. 3 is a greatly magnified section of the wall of the nerve-cavity, showing the openings of the tubes of the dentine.

FIG 3.



The enamel is composed of short, solid fibres, the end of each of which, opposite to the external surface, rests upon the dentine. These fibres are united by an intermediate substance, so that the external surface is rendered perfectly smooth. The enamel is one of the hardest of animal structures.

The cementum is very similar in structure to the bones. From true bone, both the enamel and dentine differ very materially. A characteristic feature of the structure of bone is, that it contains cells at certain intervals, these cells being connected with each other by means of minute canals.

The "nerve" of a tooth, as it is popularly called, is the remaining portion of the pulp, by means of which the dentine is formed. As the forming tooth goes on towards completion, this pulp becomes smaller and smaller, until it occupies a comparatively small part of

the crown. It is contained, in the fully formed tooth, in a cavity in the centre. (Fig. 2, *c*.)

This pulp is not merely a nerve, as is popularly supposed, but is composed of all the elements of any vital tissue. From this central pulp nerves and vessels, capable of carrying nutriment to all parts of the dentine, pass out on all sides, through the tubes, which have been described. The pulp is connected, in the fully formed tooth, with the great centres of vitality, by means of a chord, so minute that the canal, through which it passes into the fang, can scarcely be seen, with the naked eye, where it commences; and yet this hair-like chord contains an artery, a vein, a nerve, and the other organs necessary to the life of any part of the body. Through this minute chord blood is thrown at every impulse of the heart, and it is partly made up of sensitive nerves, through which sensations are conveyed from every part of the dentine. It is in this manner, through the pulp in the centre of the crown, that the whole of that portion of the tooth uncovered by the gum, is nourished.

But the pulp or nerve is not the only source from which the tooth derives its vitality. The fang is covered to its extremity by a closely adhering membrane, well supplied with vessels and nerves, which pass into the layer of cementum. It is by means of this membrane that the vitality of the exterior of the fang is preserved after the nerve is entirely removed. Although, in such case, the whole of the tooth dependent upon the nerve for vitality is dead, yet by means of the remaining vitality of the cementum of the fang, it may remain for many years in its position in the mouth, in a perfectly healthy condition. It is inflammation of this membrane and another lining the socket, which give rise to pain of a very severe character after the nerve is entirely dead. The character of the pain occurring in this way, so nearly resembles ordinary tooth-ache, that the question is often asked, if it is not strange that a tooth should ache after the nerve is dead?

II.

DECAY OF THE TEETH.

THE teeth, after they are completely formed, frequently waste away until they are entirely destroyed. When this occurs they are said to be affected with decay. This disease of the teeth is the principal one from which they suffer; it leads, indeed, to nearly all the disorders to which they are subject, or to which they give rise. It is a disorder with which all persons are more or less familiar.

The true nature of decay of the teeth is not generally understood. The most erroneous notions, indeed, in regard to it, are popularly entertained. The disorder is, however, a very simple one. It has been stated that the teeth are principally composed of lime. This sub-

stance is decomposed when certain acids come into contact with it. A striking illustration of the effect of an acid upon a body composed principally of lime, is to be found in the familiar experiment of immersing an egg in vinegar. When this is done, the lime which gives density to the shell, is, in a short time, dissolved out, leaving the contents of the egg enclosed in a tough, but yielding membrane. This result will give to the unprofessional reader an intelligible idea of the nature of decay of the teeth, although in the disorder, in question, other changes, owing to the vitality of the dentine, take place, which are not represented in the experiment referred to. But there are a number of reasons to warrant the conclusion, that decay of the teeth is due to the action of some acid. Among others, it is found that, when a tooth, out of the mouth, is exposed to the action of an acid, the lime, easily acted upon by most acids, is dissolved out in a manner similar to what occurs in decay. The acid character of the fluid contents of the

mouths of persons whose teeth are very liable to decay, can be readily ascertained by well known tests.

It is seen that the whole of a tooth, affected with decay, is not destroyed in anything like a uniform manner. The destructive process is observed to begin at some one point, some times more than one, from which it extends with greater or less rapidity. The reasons why the whole of the surfaces of the teeth exposed, continually, to contact with the fluids of the mouth, of acid character, are not destroyed in the same manner as when immersed in dilute acid is, that the acid agent contained in the mouth is too feeble, in power, to act quickly. It has been ascertained, reliably too, that while the mucous secretion of the mouths of most persons is naturally acid, the saliva is alkaline. The mucous secretion of the mouth is so small in quantity, as compared with the saliva, and is neutralized, or washed away by the latter from the exposed surfaces of the teeth, in consequence of the almost con-

stant action of the lips, tongue and cheeks. It is only when the mucous secretion is kept, for some considerable time, in contact with a certain part of the surface of a tooth, that it is capable of decomposing the enamel or dentine. For the reason stated, decay always commences at points which favor the lodgment of particles of food, or the secretions of the mouth, as on the contiguous surfaces of the teeth, or in defective places in the enamel. How much the decomposition of certain aliments may or may not aid in the destructive process, it is not necessary to undertake to state here. It is generally admitted, however, that it is most probable, that many of them merely afford a means of keeping in contact with the teeth the agents by which the enamel is decomposed.

This, then, is the whole explanation of decay of the teeth: they are made up of a substance capable of being decomposed by acids, which either exist, or are formed in the mouth, but so feeble in power as to require to

be retained for some time in contact with them to produce the effect which is called decay.

Wherever a defect in the enamel of a tooth exists, decay, in the mouths of most individuals, is sure to occur. The decay is at first confined to the defective point. As the decay progresses, the affected spot grows into a cavity, allowing the lodgment of a larger quantity of particles of food and the fluids of the mouth. The destructive agents now find a larger surface of action, coming in contact with the whole interior of the cavity, and the decay goes on with accelerated rapidity, unless some means are employed to arrest its progress.

It has been said that wherever a defect exists in the enamel, decay will take place. But decay occurs even where the enamel is most perfectly formed. This is of very common occurrence. At and near the points where contiguous teeth touch each other, the secretions of the mouth are, at all times, held in contact with the enamel. Particles of food are

frequently forced between them, and remain until they are entirely decomposed, or are otherwise removed. In this manner, such agents, capable of destroying the enamel, as may be present in the mouth, are held in contact with the part of the tooth designated, as effectually as if the enamel were defective. It may be said that, with most persons of the present time, decay is certain to take place, sooner or later, on the surfaces of the teeth at, or near, the points where they touch each other.

The phenomena attending decay of the teeth cannot be fully understood, unless their predisposition to this affection is taken into the account. There is a great deal of difference in the characters of the teeth of different individuals, and frequently, also, in the different teeth of the same person. In some teeth there is a larger quantity of the lime which constitutes the hard part, and they are more densely formed. In others there is a deficiency of this constituent; they are consequently, softer

and less able to resist attacks of decay. This latter condition depends upon several causes. 1st. A hereditary condition of the system, in which all the tissues of the body are more or less imperfectly formed. 2d. Although the general condition of the system may be apparently good, the structure of the teeth may be imperfect, as a consequence of some hereditary defect. 3d. They may be defective in structure, in consequence of some disordered condition of the system, at the time of their formation. The individual may afterwards be restored to perfect health, but the teeth never lose entirely the impress stamped upon them at the time of their formation. Defective structure of the teeth, occurring in this way, may be confined to particular parts of two teeth, the defective part corresponding, precisely, to the period of the disordered condition of the health at the time this portion of the tooth was being formed. For this reason, if a tooth is defective on one side of the mouth, it is, usually, found that the corresponding one, on

the opposite side, is in the same condition, as they are formed in pairs. In cases where the teeth are defective at some particular point, from the cause stated, the defect may be confined to several teeth, but when the disordered condition of the system has continued so long as to affect the structure of the whole of the crown of a single tooth, most of the teeth will be, to some extent, in the same condition, as nearly the whole of the permanent set are in process of formation at one time. It is, of course, out of place, in a brief treatise like the present, to do more than to glance at this feature of the subject.

III.

TREATMENT OF DECAY OF THE TEETH.

It has been stated that wherever there is a defect in the enamel decay is certain to occur. The points where the enamel is, usually, defective, when first formed, are on the grinding surfaces of the molar and bicuspid teeth. The formation of the enamel of these teeth commences at the several most prominent points; these portions of the enamel, at first separate, finally unite at or near the centres of the crowns. At these points of junction the union is, commonly, more or less imperfect. In fissures left by this imperfect formation of the

FIG. 4.



Grinding surfaces of first upper molar and second bicuspid.

enamel, (Fig. 4, *a, a, a,*) particles of food, or other substances lodge, keeping in contact with this part of the tooth the fluids of the mouth. Decay or decomposition, at such

points, is usually inevitable; no care, short of the obliteration of these fissures, can prevent its occurrence. The only manner in which this can be accomplished is by the enlargement of the fissures, unless this has already occurred as a consequence of decay, and the formation of cavities, which will securely retain some substance capable of resisting the action of the decomposing agent, and rendering the irregular surfaces perfectly plane. The material most relied upon for this purpose, at the present day, is pure gold, beaten out into thin sheets. The gold, in this form, is gradually forced into the cavities, made solid by pressure, and rendered perfectly smooth. This constitutes what is known as plugging or filling the teeth.

The teeth which soonest decay, from defects of the enamel, are the first permanent molars. These teeth make their appearance, just back of the temporary teeth, at about the time when the shedding of the latter commences. There is scarcely a child, at the present day, who

does not lose these teeth, unless they are plugged soon after they come. Unfortunately, the impression is almost universal that these teeth belong to the temporary set, and that, when lost, they will be replaced by others. A great deal of suffering and injury, extending through life, is the result of this impression, and it is a matter of no little importance that all who have the charge of children should be correctly informed in regard to this point in connection with the teeth. It is a matter very easily understood. It has been stated that there are twenty temporary teeth, and that these are succeeded by thirty-two of the permanent set. There are, consequently, twelve more of the teeth, which should remain during life, than there are of the temporary set. If any one will look at the teeth of a child three years old, it will be found that there are twenty teeth. These remain, without addition, until the child is about six years old. At this time an examination will show that four new teeth, one on each side of the two jaws, make their

appearance back of the twenty teeth before counted. These are never shed. It is a matter of great importance that these teeth should be preserved, as they are, perhaps, more useful than any of the others. It has been a practice, too common among dentists, to make no effort to preserve them, even when slightly decayed, on the ground that, if extracted early in life, the spaces occupied by them will be filled up by the advance of the second molars, which come at or about the twelfth year, and by the falling back of the bicuspides, which will then have more room, and consequently be less liable to decay. In some cases this is, undoubtedly, the result, and an important advantage is derived from their early extraction; but in a great majority of cases, the author is convinced that their loss is a disadvantage, and in many, a very serious injury. If the teeth are at all crowded, the extraction of one of the bicuspides, on each side, above and below, if necessary, is far better, especially as these teeth are of less importance, and are more

commonly lost, even after the extraction of the first molars, than any others.

But it is essential to the preservation of these teeth that they should receive attention soon after they make their appearance, or at least as soon as they take their normal position in the mouth.

The idea of placing a child, six or seven years of age, in the hands of a dentist, seems to shock the sensibilities of many persons; but it should always be remembered that the true method of avoiding painful operations on the teeth, is to give them attention as soon as the slightest evidences of decay are detected. The statement that operations for the preservation of the teeth, need never be painful, may surprise those who have suffered during many agonizing hours, in undergoing operations upon them; it is, however, strictly true, and the pain attendant upon them is always the result of deferring, too long, the attention required.

The first molar teeth of children may, gene-

rally, be preserved up to the time when the nerves become exposed. Their extraction is, then, inevitable, as it is some years after they appear to have reached their full growth, before the fangs are completed, and until this time the nerves cannot be successfully destroyed. Any attempt to do this will be followed by serious trouble, and will render their ultimate extraction necessary.

But decay may occur in places where the enamel is perfectly formed. The most destructive cases of decay are of this description. When the teeth are crowded closely together, the points in contact furnish the most favorable conditions for the occurrence of decay, as has already been stated. At the present time this is certain to occur in by far the greater number of individuals. If this statement does not hold good with regard to all children, it is certainly true of those of the female sex.

The prevention of decay of the teeth, on the surfaces in contact, will suggest itself when the causes of this affection are duly considered.

If the retention, between the teeth, of the natural fluids of the mouth, or the lodgment of particles of food, could be prevented, decay would not occur at the points designated. This may be accomplished, when the enamel is still intact, by frequently passing between them thread or floss silk. When the thread or silk cannot be conveniently used, as between the molar teeth, a tooth-pick should be employed: this should be made of wood or quill, and should be long and slender enough to pass entirely through the spaces, so as to push out any substances lodged therein. If this were faithfully and regularly done, after every meal, decay might generally be prevented at those points where it most frequently occurs, and where it is most destructive. But, when the liability to decay is very great, even the most careful attention, in the manner directed, cannot be relied upon. The teeth are sometimes so defective in structure, or the secretions of the mouth are so acid in character, that their presence during the night will, gradually, de-

stroy the enamel, at the points of contact, although the greatest care for their removal should be taken during the day time. It must be confessed, too, that care of the kind advised, requires an amount of attention which few persons will be likely to bestow. The principal difficulty, however, is in the early period of life, at which decay of the teeth commences. It is impossible to induce children, who cannot be made fully to understand the value of their teeth, to give them the necessary attention.

The question then arises: What is to be done to arrest decay of the teeth, after it has actually commenced on the sides in contact? It must be understood that if the enamel is decomposed, although so slightly as merely to amount to a roughness of its polished surface, at a small point, no kind of care on the part of the individual whose teeth are so afflicted, can stop the progress of the disease. The roughened surfaces afford lodgment for the mucous secretion, etc., and notwithstanding any efforts

in the way of the removal of these substances, the decay will go on. In order to prevent the entire loss of the teeth, the decomposed parts must be removed, and the affected surfaces left in such condition as not to afford lodgment to the food, or the secretions of the mouth.

There is but one way in which this can be accomplished: *the surfaces of the teeth on which the decomposed spots appear, must be cut away so that they cannot again come in contact.*

This practice is one of such value, and is in such direct conflict with popular notions regarding the teeth, that it is worth while to take some pains to explain its advantages, and to urge its importance.

The first point which occurs to the unprofessional reader, in regard to the method of treatment advised, is, that in separating the teeth, for the removal of decay, the enamel is destroyed. He naturally asks: Is not the enamel the protective covering of the teeth, and if this is removed, are they not more liable to decay than before? This would seem

to be certain, as the more destructible dentine is then exposed to contact with agents that were powerful enough to decompose the enamel.

It is, indeed, true, that if the enamel is removed, and the teeth left in the same condition as before its removal, that is, if the affected surfaces be allowed to come again in close contact, decay will recur, and go on more rapidly than before the removal of the decomposed parts. But when the decay has not penetrated the dentine, or has extended to a very slight depth only, in this part of the tooth, and is removed, as directed above, the disease is effectually arrested.

When decay occurs in the positions referred to, the surfaces just at or near the points of contact, are first affected. The first change in the enamel is not easily detected; the decay must have made considerable progress before it becomes apparent upon a mere cursory examination. It is, sometimes, advised to pass between the teeth, closely in contact, a piece of floss silk, the fibres of which, it is said, will be

cut by the ragged edges formed in consequence of the irregular decomposition of the enamel; but before this occurs the decay will have made greater progress than should ever be allowed. But, if the teeth suspected to be decayed are pressed apart, the slightest change in the enamel may be detected, if the examination be properly made. Sometimes there is discoloration of the decomposed point; but this is not always the case. Sometimes the affected part is whiter and more opaque than the rest of the surface; but if the light is reflected upon this part, and it is examined with a magnifying glass, it will be found that there is a slight loss of substance. Sometimes a small part only is softened, but still retains its exact form, and without any visible change in the surface until after it is cut with an instrument. Now, every one who has had the slightest experience, in regard to decay of the teeth, (and who has not?) is aware that, if not arrested, this almost imperceptible beginning of decay will continue to progress until the affected teeth are destroyed.

The simple assurance that the above conclusions, with regard to the practice proposed, are the result of very careful observations, extending over many years, will satisfy most of the patients of the writer; but it is desirable that the matter should be presented so plainly that its importance may become evident to others.

Now, let it be supposed that the two front teeth are discovered to be slightly decayed on the sides where they touch each other. What is to be done? Suppose these teeth are pressed apart, and the decomposed spots, merely, cut out, (necessarily leaving depressions at the affected points,) and are then allowed to fall back into their original positions: It will be readily perceived that conditions favoring the recurrence of decay, exist, no matter how shallow may be the depressions made by the removal of the decay. The decay inevitably continues, and, in time, the affected teeth are destroyed, unless they are plugged. If a file, sufficiently thick to cut away the en-

ture decay in the two teeth, is passed between them, and they are left in this condition, they will, in the course of a few hours, come closely in contact again, their condition being worse than before, as, in this case, the enamel is removed, and the softer dentine exposed, under the same conditions, to the action of agents by which the enamel had been decomposed. If, however, they are cut away, so as to leave a permanent separation, the bristles of the tooth-brush, when used, will reach the contiguous surfaces, and cleanse them perfectly; the act of mastication, indeed, will tend, of itself, to keep the surfaces clean, smooth and polished.

But even if the object proposed should not be accomplished, and decay should recur, the surfaces liable to be affected are so fully exposed that it can be detected as soon as it appears; the operation of filling can then be much more perfectly performed than if the same teeth were allowed to decay until it became visible, while they were closely in contact, as the cavities would then be larger, deeper, and the walls thinner and frailer.

Instead of slightly separating decayed teeth affected in the manner described, another plan has been proposed; the teeth are pressed apart, cavities formed, where the decay has begun, and filled, in the usual manner, with gold: The teeth, so treated, are then allowed to fall back into their former positions. But it must be seen that unless the decay is of such character that the gold, alone, of the fillings touch, when the teeth come again in contact, (which is rarely the case,) the condition of the surfaces, so far as relates to the circumstances favoring decay, is the same as before the occurrence of the decay; it is worse, indeed, for the junction between the gold and the orifice of the cavity cannot be so perfect as the surface presented by the intact enamel. It is not at the exact point of contact that the decay always commences, but also near to it. The results of the employment of the methods referred to, both in his own practice and that of others, has been carefully observed by the writer, but he regards it as so unreliable that he has long since abandoned it.

The above method of treatment was resorted to in order to avoid any disfiguration occasioned by separating the teeth with the file. But an unsightly separation need never be made, provided the decay is discovered, and treated, at an early period after it has commenced. In order to remove the decay, and to give to the affected surfaces the proper form, to preserve them, the front teeth may be first pressed apart, and the decay cut away from the back part, leaving a space scarcely visible from the front, but with the separation complete.

In treating the teeth in the manner described it becomes necessary to remove *every particle* of the decay; for if the slightest point is allowed to remain, it will go on. Not only must all the decomposed parts be removed, but no depressions are to be left; the whole of the affected surfaces being rendered plane, if possible. After the decay is entirely removed, the surfaces treated should be polished until they present an appearance as vitreous as the enamel itself.

The method of treatment of superficial decay of teeth, by filing the decayed surfaces, has been so long practised that its advantages do not admit of question, with those who have had an opportunity of observing the results. Experience has established the fact, that the teeth may be entirely deprived of enamel, on both sides, and remain free from decay during a long lifetime. Filing the teeth, for the removal of superficial decay, has been long practised, and there are a number of persons, now living in the city of Baltimore, whose teeth were filed by Dr. H. H. Hayden, as much as forty years since. The writer has seen a number of cases where teeth, one-third of which were filed away, remained perfectly sound for the time stated.

In addition to the advantages derived from making a permanent separation of the teeth, as stated, a change takes place in the structure of the dentine, when left exposed, which, in time, renders it quite as capable of resisting attacks of decay as the enamel itself. It is

probable that the soft contents of the tubes, composing this part of the tooth, become changed into lime, rendering the whole surface harder than dentine in its natural state. It is certain that, in time, in some cases, at least, even if left rough after having been filed, the surfaces, so treated, become smooth and polished.

There are very many strong reasons why this practice should be thoroughly carried out in the cases of children. It is less painful and fatiguing. It has been stated, in the first portion of this little work, that the dentine is, naturally, somewhat sensitive. If the enamel of a perfectly healthy tooth be cut away, it will be found that the dentine, underneath it, is slightly sensitive; this sensitiveness increases as the nerve is approached. Where the enamel, merely, is decomposed, or before the dentine is, to any great extent, involved, the affected part may be cut away without pain of consequence, commonly with none, whatever. But when the decay reaches the dentine, and

penetrates to a slight depth, the sensibility of this part is greatly increased. Nothing like tooth-ache, generally, occurs; a dull sensation of pain, or uneasiness, is frequently present, sometimes indicating the exact position of the decay. But when it becomes necessary to cut the affected part into a cavity, to receive a filling, the operation frequently causes pain of an excruciating character. So painful is the cutting of the dentine of what is called a sensitive tooth, that many persons are quite unable to endure it.

In attention to the teeth of children it is always desirable to avoid the infliction of pain; not only because all who have any interest in them desire to spare them suffering, but because it becomes impossible, when the operations required for the preservation of their teeth, are very painful, to induce children to submit to them. In this view of the case, it requires no argument to prove the value of any plan of treatment by means of which this difficulty may be avoided; a diffi-

culty which will be at once recognized by those who have had the charge of children. But, in addition to the pain often occasioned by filling the teeth, the annoyance and fatigue attending the operation are very considerable. Few adults can endure, without effort, the excessive stretching back of the lips, the holding open of the mouth to its widest extent, (frequently for a long time without intermission,) the folds of napkins under the tongue, and the force required for condensing the gold, all of which are essential, in many cases, to the accomplishment of the object in view. How can this be expected of a child? Few young children, indeed, can be found who are able to endure the inevitable fatigue and discomfort of this operation, if it is thoroughly performed; and in many cases, when it becomes necessary, it can only be imperfectly done, with the hope of preserving the teeth from immediate destruction.

But the most important reason that can be urged, in favor of the treatment proposed, is,

that by its means, the teeth are more certainly preserved, than by filling them with any substance now known. But even after the most perfect operations, in the way of filling the cavities formed by decay on the contiguous surfaces of the teeth, it not unfrequently recurs. This is especially the case with the bicuspid or side teeth. The surfaces of these teeth, in contact, are broad, and if the decay, when it occurs in them, is allowed to go on until it becomes visible, externally, their preservation, by filling, requires the best skill. Even when this is available, the difficulties, which it is unnecessary to attempt to explain here, are so great that the best operations not unfrequently fail.

A few days after the above pages were written, a young lady of fifteen, who had been in the hands of the author for some years came, by appointment, to have some operations performed. It was found, on examination, that superficial decay had been removed in the manner described, in twenty different places

on the sides of her teeth. From some of these the decay had been cut away several years before, and yet, at the places referred to, they were as perfect as at the time the operations were performed. The teeth of this child were so unusually frail, sensitive, and liable to decay, that a number of the fillings, which had been very carefully put in, had been renewed, some of them more than once.

It is well that those who have charge of children should understand, fully, the importance of frequent and thorough examinations of their teeth, as the advantages of the treatment proposed depends upon the earliest detection of the decay. It is impossible to state any general rule for the time that should be allowed to elapse between these examinations. When the teeth of a child are found to be very liable to decay, they should be examined every two or three months, from the time the shedding of the first set commences, until the change is complete. A dentist should say, when he completes the necessary operations on

the teeth of a child, at what time he considers it desirable to make another examination. If the parents neglect to send the child, at the time named, he should remind them of its necessity, and if not then sent he should decline to hold himself, in any way, responsible for the result. The injurious consequences of deferring the careful examination of the teeth of children is illustrated by a case which presented itself almost at the time this paragraph was written; such cases are of very frequent occurrence.

Two children, about eight and ten years of age, were sent to the writer. Their teeth were very frail, and after doing what was necessary, especial care was taken to examine the adjacent surfaces of the front teeth. They were forced apart so that the sides could be plainly seen; they were found to be perfectly sound. The mother was advised to send the children in a few months; but a year was allowed to elapse before they returned. It was then found that all the incisor teeth of the older child had

decayed where they were in contact, the two front ones so far as to require filling: an operation which could certainly have been avoided if they had been attended to six months sooner. In the case of the younger child decay on the sides of all the front had also commenced; it was slight, however, and was perfectly removed.

Another case of interest may be referred to. Two girls, of the ages of eleven and thirteen, were put under the care of the author. Their teeth were very frail, and decayed rapidly. The elder of the two, who was very careful and anxious about the preservation of her teeth, came of her own accord, and, when the slightest decay was detected, it was immediately removed. Nearly all the upper teeth were treated in this manner. The younger sister came, after the lapse of more than a year, suffering pain from one of the side teeth. On examination several teeth were found to be so far decayed that their preservation for many years is doubtful. In two the nerves were exposed.

The author of the foregoing pages would urge upon dentists, into whose hands they may happen to fall, the very careful consideration of the feature of practice to which he has called attention. He does not, of course, claim to have originated the method of treating superficial decay of the teeth by filing or cutting it out; this practice is, indeed, much older than himself. The point to which he desires to call special attention is, the importance of a more general application of the treatment of decay, by its early removal, so as to obviate the necessity of filling or plugging the teeth on the surfaces in contact. The beneficial result of the removal of decay is so well established that the author has no hesitation in declaring it as his conviction, that nearly all the most difficult and painful operations performed on the teeth might be avoided. If the kind of attention he has described were given, there would be no necessity for filling the teeth of children, except on the grinding surfaces of the molar or bicuspid

teeth, and, occasionally, at other points where defects in the enamel sometimes exist; these operations, too, would be of the most simple and painless character. It may be considered certain, that when decay of the incisor teeth occurs, at an early age, and, at the present day, it not unfrequently makes its appearance as early as the eighth or ninth year; it will, in time, attack all the teeth, on the surfaces in contact, except the lower incisors, which are not liable to decay. If this conclusion is correct, and all observed facts in connection with the matter go to establish its correctness, it is highly important that decay should be treated as soon as it occurs, or prevented, by the proper separation of the teeth. Experience has established the fact that decay is not liable to occur where a space between the teeth exists, naturally, or is artificially made. If there is a reasonable certainty that all the teeth, back of the incisors, will decay, is it not wise to separate them before decay occurs, as the object is then effected with less loss of sub-

stance of the teeth treated? The great tendency of the teeth of children of the present generation to decay, is admitted by all who have paid any attention to the subject, and it may be confidently asserted, that the above statement is strictly accurate. In support of this conclusion, the author need only ask the majority of his lady readers to refer to their own experience, and to consider the many wearisome and distressing hours they have spent, from year to year, undergoing dental operations in the treatment of decay occurring on all the contiguous surfaces of their teeth, without exception, from the incisor to the wisdom teeth, and many of these operations proving ineffectual. It will lead to no comfortable reflections to feel satisfied that, with proper and timely attention they might have escaped all this suffering; but as some compensation for their own misfortunes, in this respect, if the lesson is properly used, they may save their children or young friends from a like distressing experience. It has been de-

monstrated that if the decay is removed at an early period after it occurs, and permanent spaces left between the teeth, where it has made its appearance, it is effectually arrested. If the teeth are separated before it occurs at all, they cannot be in any worse condition than when it is done after decay attacks them. The author, therefore, advises, and does not hesitate to put into practice what he advises, the separation of all the teeth, back of the eye-teeth, if the incisors are decayed before the twelfth year. He does not intend, of course, to advocate the indiscriminate filing of sound teeth, as they may, and frequently do, remain sound during a long life-time, although closely in contact. The incisor teeth of a child, which furnish a test of the liability of all the teeth to decay, should not be touched until it is positively ascertained that they are decayed, and this may be very easily done by pressing them apart.

But this kind of examination should be frequently and carefully made, and when it is

found that decay has attacked them, the true policy is the most prompt and thorough attention to all the rest of the teeth as they make their appearance. In carrying out this practice the author has rarely failed to find the bicuspid and molar teeth, of both upper and lower jaws, decayed, within two years after they have made their appearance.

In publishing the foregoing portion of a fuller treatise of the same character, the author may be permitted to say that his strongest motive in doing so has been to point out, to those who have the charge of children, a method of treatment which a very extended experience has satisfied him is, by far, the most reliable means of preserving the teeth, and of avoiding many very painful and expensive operations.

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